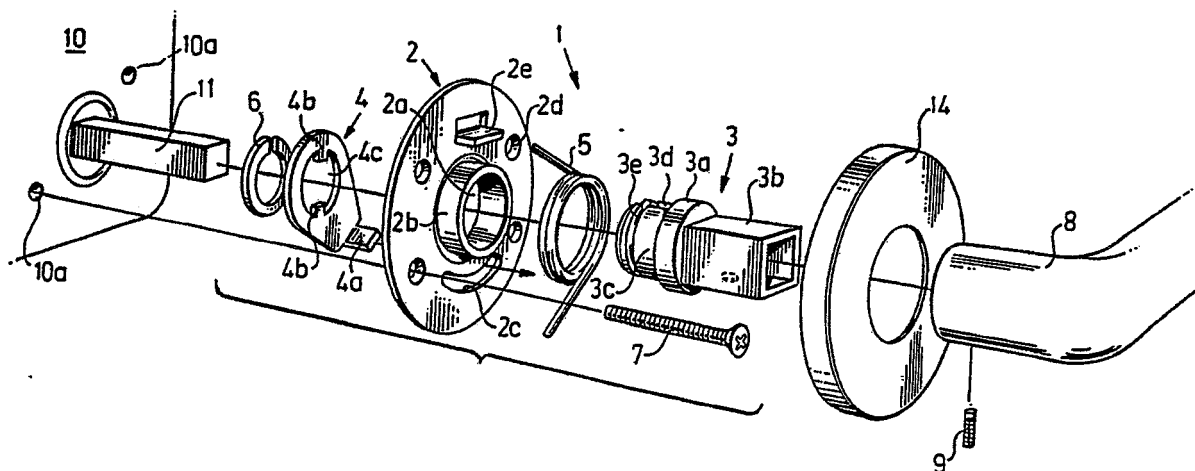


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(54) Title: A DOORKNOB ASSEMBLAGE



(57) Abstract

A doorknob assemblage comprises a rose plate (2), a hub section (3), a torsion spring (5), a locking device (6), and a dogging component (4). The dogging component is intended to co-act with the hub section (3) on one side of the rose (2) and is provided with an axially extending abutment member (4a) which passes through a slot (2c) in the rose in a manner to co-act supportingly with the spring on the other side of the rose. The two ends of the slot determine respective terminal positions of the doorknob or like latch release device. The doorknob assemblage is fitted onto a spindle or pin (11) of square cross-section which extends from a lock housing (10). The hub section (3) and the dogging component (4) may optionally comprise a single piece structure.

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A DOORKNOB ASSEMBLAGEField of Invention

The present invention relates to a doorknob assemblage, one end of which is intended to be fitted onto a spindle of square cross-section or a corresponding element which extends from a lock housing, and the other end of which is intended to cooperate with the shaft part of a doorknob or corresponding door latch release device, and which doorknob assemblage is, in other regards, of the kind set forth in the preamble of the following Claim 1. The term doorknob as used here and in the following also includes door latch release devices in the form of a lever.

One of the purposes of a doorknob assemblage of this kind is to define the two terminal positions of rotation of the doorknob or door lever; wherewith the torsion spring incorporated in the doorknob assemblage assists the spring in the lock housing to return the doorknob to its starting or rest position. In the case of door levers, this will prevent the lever from swinging down undesirably from its rest position under its own weight after having been in use for some time.

Background Prior Art

Different kinds of doorknob assemblages or door rose assemblages are known to the art. One common embodiment of such known assemblages comprises a lathe-turned rose, which is also machined in various other ways and which forms a visible part on the outer surface of the door to which it is fitted and which must therefore have an aesthetic appearance. Roses of this kind have an inner machined surface which co-acts functionally with a hub section which accommodates the spindle of square cross-section extending from the lock housing fitted to the door. The hub section is

embraced by a torsion spring, which is accommodated in a widened part of the rose. The rose is secured in position by means of screws which are screwed into screw threaded holes from the inside.

- 5 Due to the many machine working operations required and the aesthetic requirements placed on such roses, the costs of producing the roses are relatively high.

- 10 DE-A-34 44 447 (Baldwin Hardware) describes another type of doorknob assemblage, the various components of which, in the mounted state of the assemblage, are encased in a cover-plate or finishing plate so as to be invisible from the outside, which covering plate can be made relatively thin and fulfills high aesthetic requirements despite its low cost. The components included in the inner part of the doorknob
- 15 assemblage co-act with one another and with the square spindle within the cover plate. The various components of the doorknob assemblage form a unit which are fitted to the lock housing at their place of use, when fitting the doorknob to the door.

- 20 The object of the known arrangement is to enable the tension of the torsion spring to be pre-set, so that the spring force exerted by the spring can be adapted to the various doorknobs or like door latch release devices to be used together with the doorknob assemblage. When the door latch
- 25 release device has the form of a heavy door lever, adjustments must be made in order to increase the force exerted by the torsion spring.

- 30 This separate adjustment possibility complicates the doorknob assemblage as a whole and renders the same more expensive.

Object of the Present Invention

One object of the present invention is to provide a door-knob assemblage which is of simple construction and which can be comprised of simple and inexpensive components which require a minimum of machine working.

Another object is to provide a doorknob assemblage which despite its simplicity is highly reliable and capable of operating satisfactorily and reliably over a long period of time.

Still another object of the invention is to provide a doorknob assemblage which can be readily assembled into the form of a unit and then readily fitted to a square spindle of a lock housing and to a doorknob or lever at the place of use, without requiring complicated adjustments or setting operations.

Summary of the Invention

A doorknob assemblage according to the invention which fulfills these and other objects is of the aforesaid kind and is mainly characterized by a dogging component which is intended to co-act with the hub section of the assemblage on one side of the rose plate and which is provided with an axially extending abutment member which passes through a slot in the rose plate in a manner to co-act with the located spring on the other side of said rose plate, the ends of the slots determining the terminal rotational positions of the doorknob or lever.

Because the dogging component and the spring are located on mutually opposite sides of the rose plate in the aforesaid manner and co-act with one another via a slot, the doorknob assemblage is able to comprises solely a few simple components and can be given a short axial length. Furthermore,

the various components can be assembled more readily.

5 The rose plate itself comprises a preferably circular, punched sheet-metal element from which there is folded a part which serves as an abutment member for supporting one end of the spring, and in which there is punched a slot through which the abutment member of the dogging component can pass for supportive co-action with the other end of the spring. The ends of the slot will therewith accurately define the terminal positions of the doorknob or lever.

10 The dogging component may also be given a simple form and, for example, comprises a punched sheet-metal element having a folded part which is inserted through the slot and forms abutment means.

15 The same also applies to the hub section, which in addition to the hub part may present a folded sheet-metal hollow shaft of square cross section intended for accommodating the square spindle.

20 The dogging component may be located on the outward side of the rose plate, i.e. on the side facing the doorknob or lever, the torsion spring being thus located on the inward side, i.e. the side facing the lock housing.

25 In a preferred embodiment, however, the dogging component is located on the inward side, or lock-housing side of the rose plate, such as to co-act with the spring on the outward side, or doorknob side, of the doorknob assemblage, via the abutment member.

In accordance with one embodiment, the dogging component comprises an element which is separate from the hub section.

In this respect the hub section itself may comprise a simple cylindrical sleeve or may be integral with the sleeve part.

5 In this embodiment the locking means may have the form of a clip which co-acts with projections on the sleeve of square cross-section.

As beforementioned, the rose plate may have essentially the same form in both embodiments and preferably comprises firstly a circular plate having a cylindrical neck part which surrounds the hole located centrally in said plate and which is preferably drawn or likewise extended in one piece with the plate and serves as a journal for the hub section, secondly an outwardly folded part which functions as an abutment for one end of the spring, thirdly a slot through which the abutment member on the dogging component passes, and fourthly screw holes for accommodating screws for securing the doorknob assemblage to the locking housing.

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A rose plate of this kind can be mass manufactured from punched sheet metal, wherewith the abutment member, the slot and the screw holes are suitably punched-out simultaneously with the rose plate itself. The neck part can be drawn out from the plate and the central hole formed simultaneously therewith in the plate.

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According to one preferred embodiment of the invention the rose plate has provided therein four symmetrically located screw holes, respective pairs of which are used alternatively in the case of right hung and left hung doors respectively.

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In addition hereto, the rose plate may be provided with additional holes for co-action with corresponding screws of doorknob roses constructed to meet the lock standards of

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In this regard, the hub section may present on one side of a hub part a sleeve which is intended to embrace the square spindle, and on the other side of the hub part a preferably cylindrical part having means, e.g. a groove, for co-action with corresponding means, e.g. a projection, on the dogging component, and means, e.g. a circumferential groove, for co-action with the locking means, which locking means may comprise a locking ring for example.

In this regard, the dogging component preferably comprises a punched sheet-metal element having a preferably cylindrical recess for the hub section, a projection for engagement in a groove provided in the hub section, and an outwardly folded abutment member for co-action with the spring.

In accordance with an alternative embodiment, the hub section and the dogging component are joined together.

In this way the number of components forming the doorknob assemblage is further reduced. Thus, only four components are required, namely the combined hub section and dogging component, the rose plate, the torsion spring and the locking means. The screws used to secure the doorknob assemblage to the lock housing are additional hereto.

The rose plate may have the same or essentially the same form in both of these main embodiments.

In the case when the hub section and the dogging component are joined together, the cylindrical hub part of the hub section is preferably connected on the inwardly facing side with a folded sheet-metal sleeve of square cross-section, and on the other side with a punched and folded sheet-metal part which forms the dogging component and which is provided with a recess.

different countries.

Two embodiments of the invention will now be described in more detail with reference to the accompanying drawings.

Brief Description of the Drawings

5 Figure 1 is a perspective exploded view of the components of an inventive doorknob assemblage forming part of a door-knob construction and being intended to co-act with a spindle of square cross-section that extends from a lock housing, and also with a rose plate assembly and a doorknob or door lever.
10 Those parts of the Figure 1 illustration which comprise the inventive assemblage are contained within the large bracket.

Figure 2 is a perspective exploded view of an alternative embodiment of the doorknob assemblage.

15 Figure 3 is a front view of the doorknob assemblage in Figure 1 and shows the assemblage in its starting or first terminal position of rotation.

Figure 4 is a front view which corresponds to the view of Figure 3 and which shows the doorknob assemblage in a second terminal position of rotation, subsequent to being activated
20 by the doorknob or lever.

Figure 5 is a cross-sectional view of the doorknob assemblage illustrated in Figure 1, with the assemblage fitted to a door.

25 Figure 6 is a cross-sectional view of the alternative Figure 2 embodiment, likewise fitted to a door.

Description of Preferred Embodiments

Referring first to Figures 1, 3-5, the reference numeral 1

identifies generally a plurality of assemblage components, comprising a rose plate or washer plate 2 which can be secured non-rotatably to a lock housing 10 by means of screws 7. The rose plate 2 has a central hole 2a which accommodates a spindle 11 of square cross-section extending from the lock housing.

The doorknob assemblage also comprises a hub section, generally referenced 3, a dogging component, generally referenced 4, a torsion spring 5, and a lock ring 6.

The rose plate 2 has punched therefrom an outwardly projecting part 2e which is intended to cooperate supportingly with one end of the torsion spring 5, and also incorporates a slot 2c for receiving and accommodating an abutment member 4a folded outwardly from the dogging component 4. The abutment member 4a is intended to co-act supportingly with the other end of the torsion spring 5.

The rose plate 2 of the inventive doorknob assemblage also includes a centrally located neck portion 2b which surrounds the hole 2a and the inner surface of which serves as a bearing surface for a cylindrical hub part 3a of the hub section 3.

In addition to the cylindrical hub part 3a, the hub section includes on one side of said hub part a hollow shaft 3b of square cross-section which is intended to embrace and accommodate the square spindle 11. Located on the other side of the cylindrical hub part 3a is firstly a further cylindrical surface 3c, which has formed therein two grooves or slots 3d for co-action with a respective one of two projections or shoulders 4b on the dogging component 4, and secondly a circumferential groove 3c into which the lock ring 6 is fitted.

The hub section 3 may be shaped from a single piece of sheet metal. The same also applies to the rose plate 2 and to the dogging component 4.

Figures 3 and 4 are both front views of the assemblage in its assembled state. The torsion spring 5 is fitted to the neck 2b on the rose plate 2, with one end of the spring in co-operative engagement with the abutment member 2e. A corresponding abutment member 4a on the dogging component 4 extends through the slot 2c in the rose plate 2 and is in co-acting supportive abutment with the other end of the spring 5.

Figure 4 illustrates the state of the assemblage when a doorknob in the form of a door lever 8 is manipulated in a manner which causes the abutment member 4a to move to the opposite end of the slot 2c against the action of the torsion spring 5, the slot 2c thus defining the two terminal positions of rotation of the lever 8.

The cross-sectional view of Figure 5 also illustrates the manner in which the various components of the doorknob assemblage co-act with one another and with the spindle 11 and the door lever 8. The Figure illustrates that the doorknob assemblage has a short axial length - at least with the exception of the hub section 3b, which may be given a varying form and extension in dependence on the length of the spindle 11 and the form of the shaft of the lever 8. The doorknob assemblage, with the exception of the projecting cylindrical hub part 3b, is housed in a finishing plate 14 of the rose assembly. The hub part 3b, on the other hand, is accommodated in the hollow doorknob shaft, which has a corresponding square cross-section.

The screws 7 for securing the doorknob assemblage are re-

ceived in screwthreaded holes 10a in the lock housing.

In the variant illustrated in Figures 2 and 6, the hub section, here referenced 3', and the dogging component, here referenced 4' are connected together. The cylindrical hub part 3'a of the hub section 3' is joined with a folded sheet-metal square sleeve 3'b and with a punched and folded sheet-metal part 4' which is provided with a recess and which forms the dogging component and which presents a folded abutment member 4'a. The hub section of this embodiment may also be punched in one single piece from punched sheet-metal and brought to the illustrated configuration. The various components may be welded together.

In the illustrated embodiment, the sleeve part 3'b is closed at one end by means of an overfolded forward portion 3'f which has a hole 3'g provided therein. As illustrated in Figure 6, the hole 3'g of this embodiment is intended to accommodate an axially extending screw 12 for securing the lever 8 to the doorknob assemblage. This screw may be additional to the radial screw 9, thereby affording a more positive and reliable connection, or may replace the radial screw 9.

It will be seen from the drawings that the rose plate 2 incorporated in the doorknob assemblage 1' of the embodiment illustrated in Figures 2 and 6 has the same form as the rose plate of the embodiment illustrated in Figures 1 and 3 - 5. Additional to the aforescribed elements the rose plate 2 has four symmetrically positioned screw holes 2d, respective pairs of which are used alternatively for securing the rose to either a left hung or a right hung door.

The rose plate may also be provided with additional holes for accommodating other types of doorknobs, levers or like

handles, e.g. doorknobs of non-Swedish standard.

It has been shown in the foregoing that the primary object of the invention, namely that of providing a constructive doorknob assemblage which is capable of being manufactured readily and easily, can be achieved in various ways within the scope of the basic inventive concept. It will be understood that embodiments of the doorknob assemblage other than those described above are conceivable. For example, the position of the rose plate may be reversed and the torsion spring 5 arranged on the inward of the rose. This variant will, in turn, require some modification to the hub section and the dogging component respectively. Other modifications are also possible within the scope of the invention.

CLAIMS

1. A doorknob assemblage which is intended to be fitted at one end thereof onto a spindle or like element of square cross-section extending from a lock housing, and to be fitted at its other end onto the shaft of a doorknob, door lever or like door latch release device, said doorknob assemblage comprising

a) a rose plate (2) which is secured non-rotatably to the lock housing (2) and which is provided with a centrally located hole (2a) for accommodating the spindle (11),

b) a hub section (3; 3') which incorporates a bearing surface (3a; 3'a) which co-operates with a bearing surface (2b) on the rose plate for rotation between two terminal positions, and a part (3b; 3'b) intended for co-action with the square spindle (11) and the doorknob or like door latch release device,

c) a torsion spring (5) having a first end which co-acts with a member (2e) provided on the rose plate and a second end which co-acts with the hub section in a manner to restore the doorknob to its starting position, and

d) a locking means (6; 6') which holds the components of the doorknob assemblage together in the form of a unit for co-action with one another,

characterized by

e) a dogging component (4; 4') which is intended to co-act with the hub section (3; 3') on one side of the rose plate (2) and which is provided with an axially extending abutment member (4a; 4'a) extending through a slot (2c) formed in the

rose plate (2), in a manner to co-act with the spring (5) on the other side of the rose, the ends of the slot determining the terminal positions of the doorknob (8).

2. A doorknob assemblage according to Claim 1, characterized in that the dogging component (4; 4') is located on the inward side, or lock housing side, of the rose plate such as to co-act with the spring (5) on the outward side, or doorknob side, of said rose plate, via the abutment member (4a; 4'a).

3. A doorknob assemblage according to Claim 1 or 2, characterized in that the dogging component (4) comprises an element which is separate from the hub section (3).

4. A doorknob assemblage according to Claim 3, characterized in that the hub section (3) presents on one side of a hub part (3a) a sleeve (3b) which is intended to embrace the square spindle (11), and presents on the other side of the said hub part a preferably cylindrical part provided with means (3d) for co-action with a corresponding means (4d) on the dogging component (4) and means (3e) for co-action with the locking device (6).

5. A doorknob assemblage according to Claim 4, characterized in that the dogging component comprises a punched sheet-metal element (4) having a preferably cylindrical recess (4c) for accommodating the hub section, a projection (4b) for engagement in a groove or slot (3d) in the hub section, and an abutment member (4a) for co-action with the spring (5).

6. A doorknob assemblage according to Claim 1 or 2, characterized in that the hub section (3') and the dogging component (4') are joined together.

7. A doorknob assemblage according to Claim 6, characterized in that the cylindrical hub part (3'a) of the hub section (3', 4') are joined with a folded sheet-metal sleeve of square cross-section and with a punched and folded sheet-metal part (4') which is provided with a recess and which forms the dogging component (4', 4'a).

8. A doorknob assemblage according to Claim 7, characterized in that the locking device comprises a circlip, locking ring or like device (6') intended for co-action with a projection on the sleeve of square cross-section.

9. A doorknob assemblage according to any of Claims 1-8, characterized in that the rose plate comprises a circular plate (2) having provided thereon firstly a cylindrical neck part (2b) which surrounds the centrally located hole (2a) and which is preferably drawn integrally with the rose plate and serves as a bearing for the hub section (3), secondly an outwardly folded part (2e) which serves as a support surface for one end of the spring (5), thirdly a slot (2c) for receiving and accommodating the abutment members (4a; 4'a) of the dogging component (4; 4'), and fourthly holes (2d) for screws (7) intended for securing the doorknob assemblage to the lock housing (10).

10. A doorknob assemblage according to Claim 9, characterized in that the rose plate is provided with four symmetrically located screw holes (2d) of which given pairs are used alternatively when fitting the assemblage to right hung and left hung doors respectively.

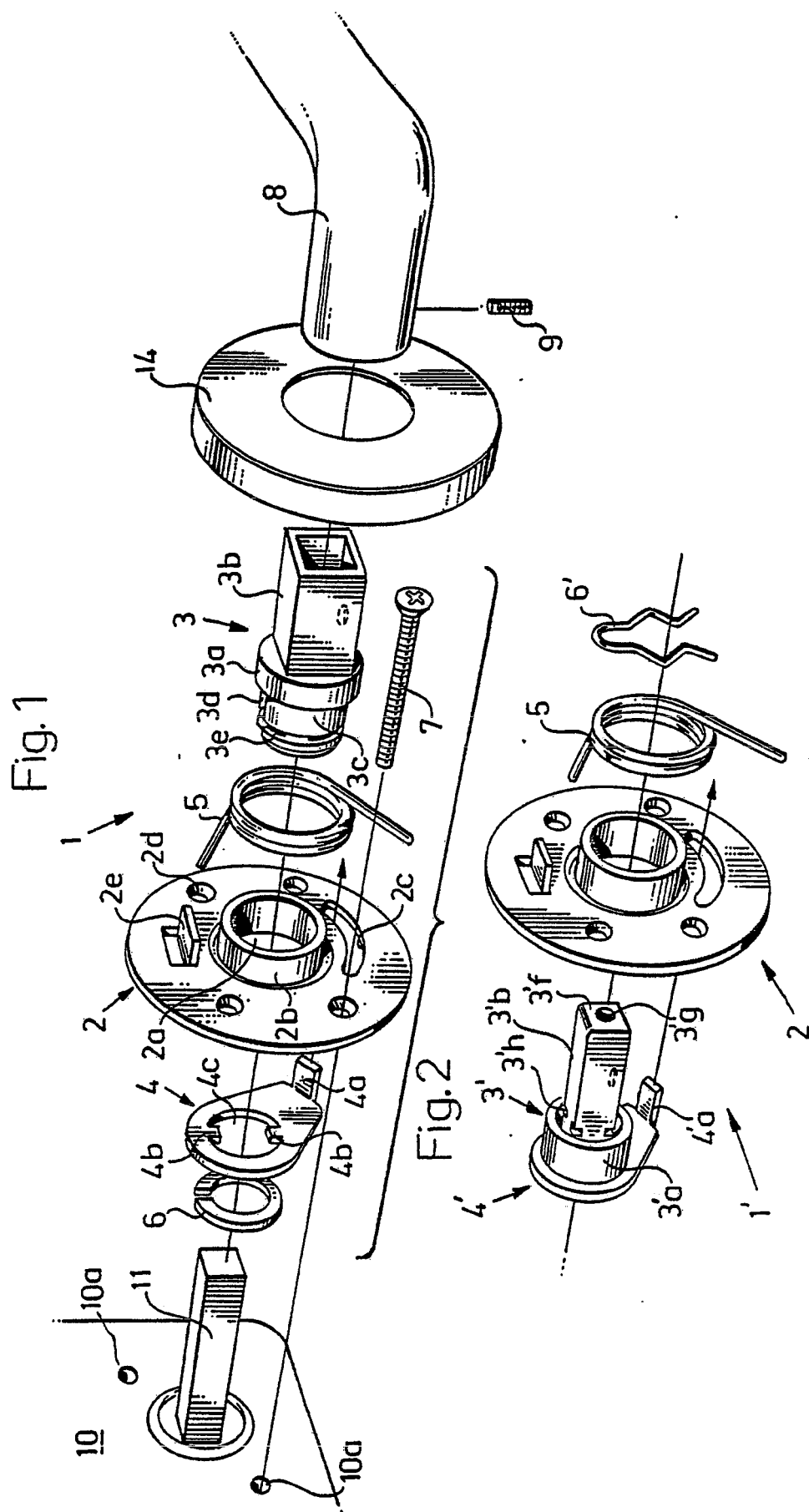


Fig. 3

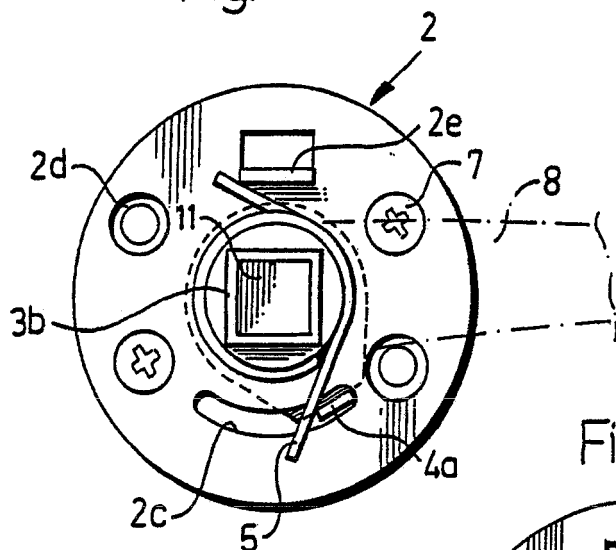


Fig. 4

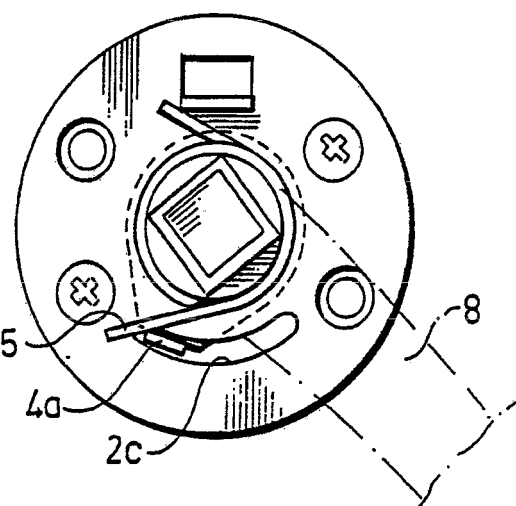


Fig. 5

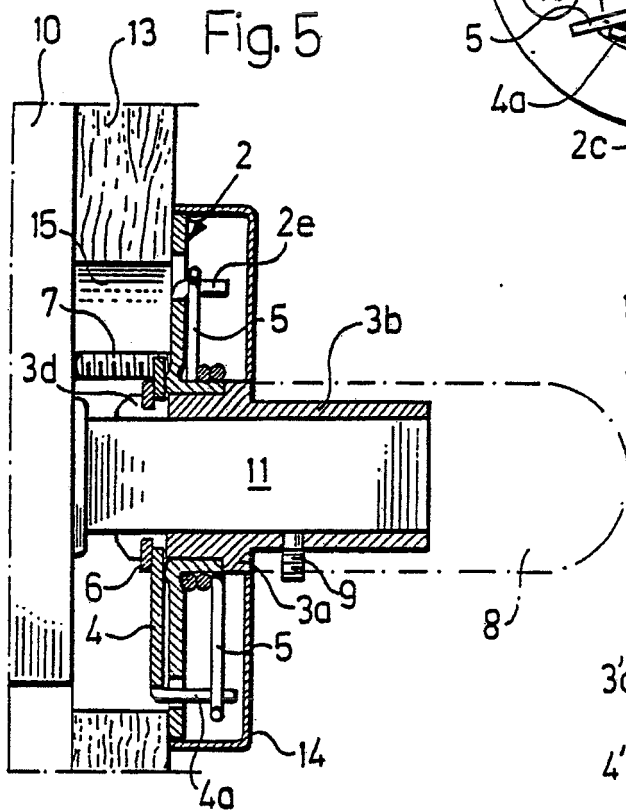
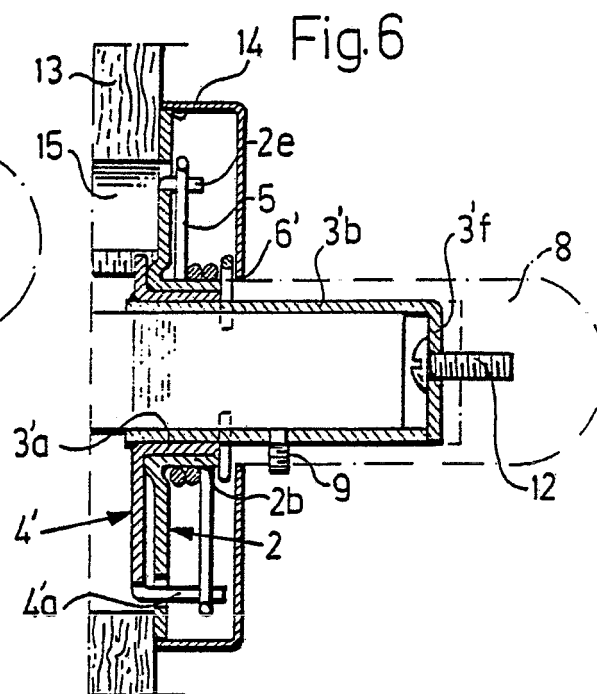


Fig. 6



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE87/00434

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC ⁴		
E 05 B 15/04, E 05 B 17/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC 4	E 05 B 17/00, 15/02-/04, 3/00-/06	
Nat.C1	68a: 76, 79/06	
US C1	292: 348, 356	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	AU, B, 532 292 (NEWMAN et al) 4 December 1980	
A	GB, A, 708 303 (NEALE) 5 May 1954	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1987-12-20	1987 -12- 23	
International Searching Authority	Signature of Authorizing Officer	
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